

NON-PUBLIC?: N  
ACCESSION #: 8903080477  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: ZION UNIT 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000295

TITLE: Turbine and Reactor Trip While Troubleshooting Safeguards Test Circuit  
EVENT DATE: 01/27/89 LER #: 89-002-00 REPORT DATE: 02/27/89

OPERATING MODE: 1 POWER LEVEL: 099

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Bob Soden Technical Staff Engineer Ext. 322 TELEPHONE: 312-746-2084

COMPONENT FAILURE DESCRIPTION:  
CAUSE: X SYSTEM: J E COMPONENT: IL MANUFACTURER: C322  
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

While investigating failure of a safeguards test light to light, the Unit 1 turbine tripped which resulted in a reactor trip. All safety related equipment operated as expected. As the operator was holding a test pushbutton and depressing the test light, a technician placed leads across two adjacent terminals in the circuit to simulate the coil of the circuit. When the test leads were placed in the circuit, a turbine trip signal was developed and tripped the turbine. Investigation indicated that the most likely cause of the event was the technician placing the leads across incorrect terminal points. The cause of the test light failing to light was a blown bulb and faulty socket. The bulb and faulty socket were replaced. The circuit was tested and verified operating correctly prior to startup of the reactor. The Electrical Maintenance Department will review this event and stress the importance of awareness during troubleshooting.

END OF ABSTRACT

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## A. CONDITION PRIOR TO EVENT

MODE 1 - Power Operation RX Power 99%  
RCS ABI Temperature/ Pressure 559 degrees F/2235 Psig

## B. DESCRIPTION OF EVENT

On January 27, 1989, while investigating failure of a test light to light, the Unit 1 turbine tripped which resulted in a reactor trip. Unit 1 was operating at 99% power.

While performing Periodic Test (PT-10), test light #51 failed to light as required. Test light #51 indicates continuity through the steam generator Hi-Hi level turbine trip circuit. Initial troubleshooting indicated that the test light socket was not working correctly. The light socket and bulb were replaced but the test light still failed to light when required. Further troubleshooting was then performed. The technician performing the troubleshooting was using standard methods of determining the location of what appeared to be an open circuit. The test light bulb was replaced again. Both resistance and voltage checks were made at various points in the circuit to locate the problem. As the operator was holding a test pushbutton and depressing test light #51, the technician placed leads across two adjacent terminals in the circuit to simulate the coil of the circuit. When the test leads were placed in the circuit, a turbine trip signal was developed and tripped the turbine. The circuit was immediately taken out of test by the operator and all testing stopped while the unit was being shutdown.

The circuit was inspected in detail for wiring and connection validity and no discrepancies were found which could explain why placing the test leads across the solenoid coil would cause the coil to energize and trip the turbine. The review of the circuit did identify that the solenoid coil could be energized if the test leads had been installed across incorrect terminal points which are located in close proximity to the correct terminal points.

On January 28, 1989, prior to criticality, testing was performed to attempt to duplicate the turbine and reactor trip. The first part of the testing was conducted using the applicable sections of PT-10 for light #51. All sections were completed satisfactorily and verified that the circuit was operating properly. The second part of the testing attempted to determine the cause of the event by repeating the troubleshooting steps. During initial troubleshooting, the test leads should have been installed across terminal points 2 and 3. When the leads were placed across terminal points 2 and 3 during subsequent testing, the turbine did not trip. A turbine trip was produced, however, when the test leads were

placed across incorrect terminal points 2 and 4.

#### C. APPARENT CAUSE OF EVENT

The reactor trip event is attributed to personnel error. Subsequent inspection and testing did not identify any wiring or troubleshooting discrepancies which would have tripped the turbine. Testing did show that placing the test leads across the wrong terminal points would trip the turbine. The apparent cause of the test light failure was a blown light bulb and faulty socket in the original light fixture.

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#### D. SAFETY ANALYSIS OF EVENT

There were no safety concerns associated with this event. All components and systems operated as expected during the turbine trip and subsequent reactor trip.

#### E. CORRECTIVE ACTIONS

Immediate corrective actions were to remove safeguards from test and to follow the procedures for turbine and reactor trip. Subsequent actions attempted to identify the cause of the trip. This event, and the importance of insuring correct lead placement during testing or troubleshooting, were discussed with the personnel involved. The Electrical Maintenance, Instrument Maintenance, and Production and Construction Services (PACS) departments will review this event and stress

the importance of awareness during troubleshooting.

The light fixture and bulb were replaced for the test light.

#### F. PREVIOUS EVENTS

A review of the Licensee Event Report files identified previous occurrences of reactor trips caused by testing or troubleshooting coupled with personnel errors.

In this event, proper work practices were observed, the technician was using adequate procedures, but was working in a confined space which contributed to the event.

#### G. COMPONENT FAILURE DATA

Manufacturer Nomenclature Model Number

Chicago Miniature Light Bulb 87A

ATTACHMENT 1 TO 8903080477 PAGE 1 OF 1

Commonwealth Edison  
Zion Generating Station  
101 Shiloh Blvd.  
Zion, Illinois 60099  
Telephone 312/746-2084

February 27, 1989

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Dear Sir:

The enclosed Licensee Event Report number 89-02-00, Docket No. 50-295/DPR-39 from Zion Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv), which requires a 30 day written report when any event or condition that results in manual or automatic actuation of any Engineered Safeguards Feature (ESF), including the Reactor Protection System (RPS).

Very truly yours,

T. P. Joyce  
Station Manager  
Zion Generating Station

TPJ/ts

Enclosure: Licensee Event Report

cc: NRC Region III Administrator  
NRC Resident Inspector  
INPO Record Center  
CECo Distribution List

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